



24

Preliminary Prospectus

OF THE

CHROME MINING

AND

MANUFACTURING COMPANY,

BOLTON, CANADA EAST.

1863
(34)

24

CHROME MINING

MAINTAINING COMPANY

JOHN J. JONES

CHROME MINING AND MANUFACTURING COMPANY.

BOLTON, CANADA EAST.

PRELIMINARY PROSPECTUS.

Chromic iron ore is well known to be a mineral of great importance in the arts, as the source of the various valuable chromatic salts so extensively used in dyeing, calico printing and color-making.

Hitherto the principal supply has been obtained from the Bare Hill Mines in Maryland, and at other localities near the state line between Maryland and Pennsylvania. The Bare Hill Mines have yielded during the last twelve years, for exportation to England, not less than 21,200 tons valued at \$800,000, besides that supplied for home consumption.

The supply from these sources is now understood to be becoming exhausted, while the demand both for home consumption and for exportation is largely on the increase.

Such circumstances viewed in connection with the fact, that the aggregation of this ore in workable quantity at any one place is of rare occurrence, render the discovery and development of chrome mines well worthy the attention of enterprising capitalists.

Among the mineral treasures which have recently been brought to light in Eastern Canada, this valuable ore occupies an important place; but although somewhat extensively diffused, it is only in a very few localities that it occurs in sufficient quantity to be economically available. Of these the most important, so far as yet explored, is the 26th lot of the 6th range of the township of Bolton, where the great size of the masses obtained, and the facility with which they are extracted, attest at once the importance of the deposit, and the economy with which it may be worked.

At this place the ore occurs in a vein or bed in serpentine, a band of which traverses the slate rock of the country, standing up in a ridge elevated 50 or 60 feet above the general surface and running longitudinally through the lot. Very little has as yet been done to develop the mine, but the surface indications, and the work which has been done, afford ample promise of rich and extensive deposits. The ore occurs in a gangue of steatite or soapstone, forming a vein or bed varying from twelve to twenty-four inches in thickness, and which has been traced about sixty yards longitudinally. The vein is nearly perpendicular, and the ore occurs in it in masses of from fifty to one thousand pounds weight. The specimens which have been obtained were extracted without blasting, having been merely cut off the soft soapstone gangue with an axe; two men took out in this way two tons of the ore in less than two days. The ore is remarkably rich and pure, containing at least fifty per cent. of sesqui-oxide of chromium.

On the same run of rocks, about five miles to the southwest, copper ore has been found, and there is good reason to believe it may also be discovered in available quantities on this lot. The serpentine, soapstone and other minerals on the property will also probably be found valuable. This lot is situated about four miles from the navigable Lake Memphramagog, which will shortly have railway connections with both the Atlantic and St. Lawrence ports of shipment.

It is now proposed to form a Joint Stock Company to extract the chromic iron ore and other minerals for the market. It is further proposed, as one of the objects of the Company to manufacture a portion of the produce of the mines into the chromate and bi-chromate of potash, and other valuable derivatives, so far as it may be found profitable to do so.

The cost of mining and transportation of the ore to market at Boston or New York, including all expense for barrels, dressing, &c., may be safely estimated at \$16 per ton. The price of the ore in England, where there is a steady and extensive demand, is about \$60 per ton for ore of this quality and produce. This would leave a large margin for profit upon the exportation of the crude ore; but a much larger return will be realized by investing a mo-

derate capital in the preparation and manufacture of the chromate and bi-chromate of potash, and the various other chromatic salts, both for home consumption and for exportation.

In carrying out this project of manufacturing the chromatic salts, it is proposed to establish works both in the United States and in Canada, so that the Company may derive the benefit of all fiscal regulations, affecting the import and export of the crude and manufactured materials. In manufacturing for the supply of the United States, it will be of advantage to import the crude ore, which is admitted duty free, while for the supply of the Canadian market, and probably also for exportation to England, it will be preferable to establish works in Canada. The advantages attending this last mode of operation, which are great and obvious, may be thus enumerated :

1st. In this manufacture large quantities of potash are consumed ; and as it is chiefly from Canada that England is supplied with potash, the increased cost due to freight, &c., is saved by manufacturing in the Province ; as also the cost of transportation on that portion of the ore which is not economically available.

2nd. The bi-chromate can be manufactured in Canada at a cost at least 30 per cent. lower than the price of the imported article ; and as the latter is always in a chrystallized state, while the requirements of color makers and others who use it do not demand this, the extra labor and expense of this process will be saved. Should the cost of the sulphuric acid used in converting the chromate into bi-chromate be an objection, a crude neutral salt might readily be prepared at or near the mines by simple evaporation, which might be shipped to England (for conversion into the bi-chromate), and sold to the manufacturers there at a price so much in advance of that of the ore, as to yield a very handsome return upon the trifling amount of labor required to bring it into that state.

Many other items of economy in this manufacture are known to the promoters of this project, but unnecessary here to be detailed. The same arguments which have been employed to show the advantage of manufacturing in Canada, rather than exporting the crude ore to England, will apply with equal force to the system of manufacturing in the United States.

The operations of the Company may advantageously be extended still further so as to embrace the manufacture of the chrome colors themselves and of many chemical products, some of which are directly required, and others incidentally produced in the processes required for the conversion of the chromic iron ore; as for example :—

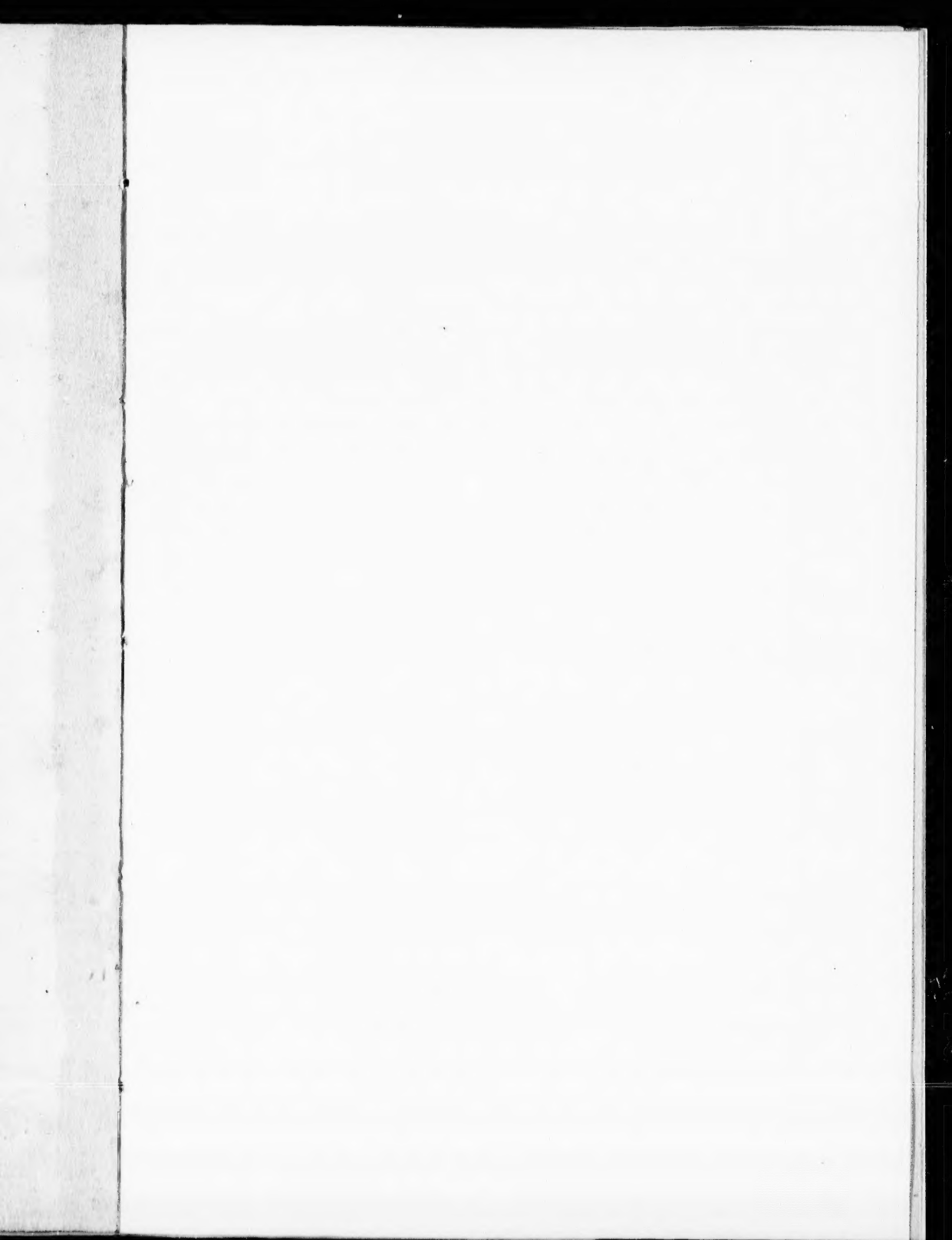
1. Potash.
2. Nitric Acid.
3. Nitrate of Potash.
4. Bi-chromate do.
5. Chrome Yellows.
6. do Greens.
7. do Reds.
8. Prussian Blue.

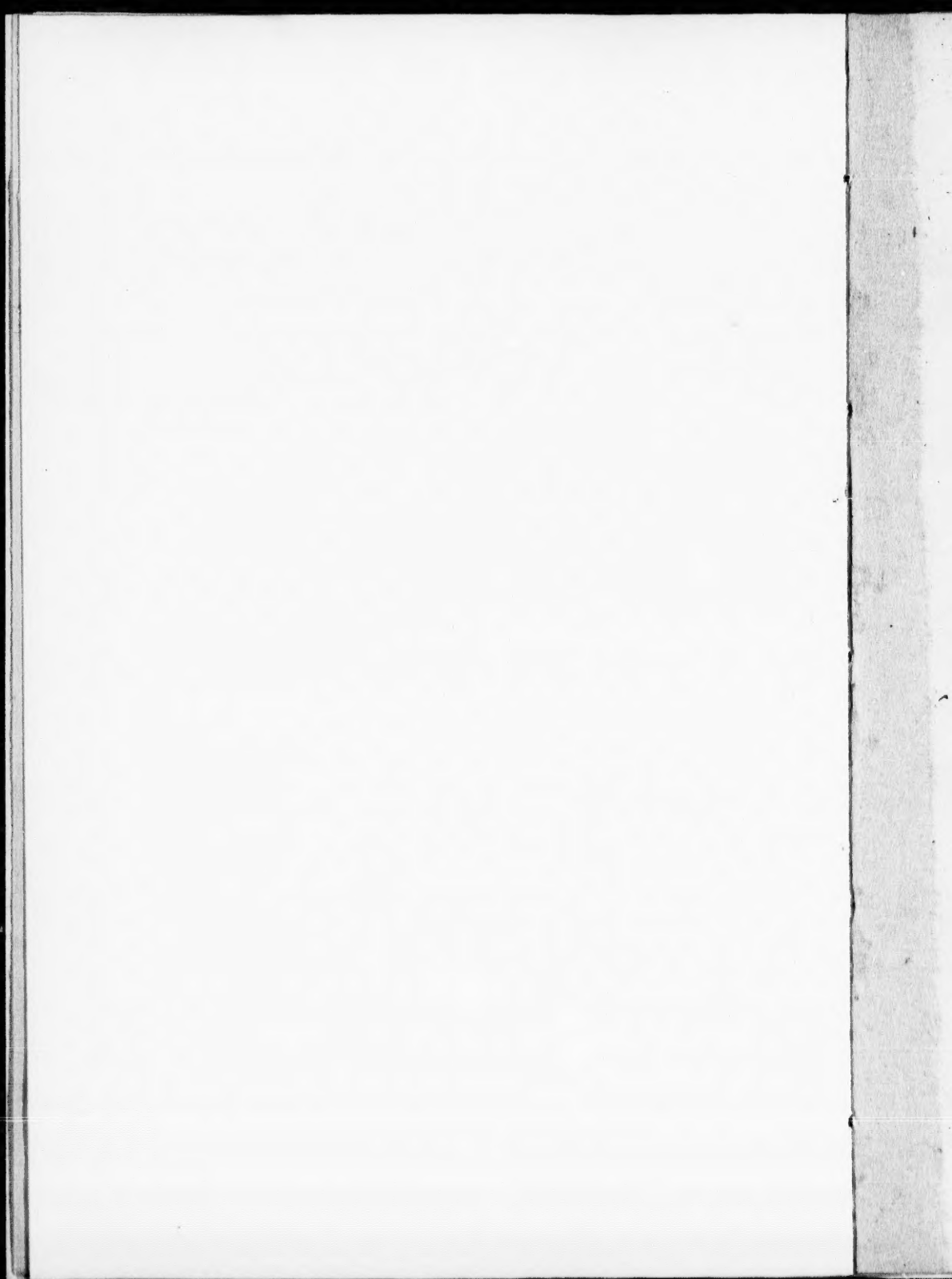
The demand for these several articles in the United States and Canada, is sufficiently large to give employment to any Company.

Should the Company desire still further to increase their manufacturing operations, they might advantageously embark in the following additional branches of chemical manufacture, for which the raw materials exist in abundance in Canada, and for the preparation of which, in many of the stages, the same machinery and plant would be available, viz. :—

- | | | |
|--------------------------|---|-------------------------------|
| 1. Sulphate of Iron, | } | From Iron and Copper pyrites. |
| 2. " Copper, | | |
| 3. Oil of Vitriol, | | |
| 4. Emerald Green, | | |
| 5. Sulphate of Magnesia, | } | Magnesite. |
| 6. Carbonate " | | |
| 7. Oxide " | | |
| 8. Sulphate of Lead, | } | Galena. |
| 9. Carbonate " | | |
| 10. Nitrate " | | |

Subjoined is an estimate of the cost and profit of the manufacture of chromate and bi-chromate of potash, carefully prepared with the assistance of an experienced practical chemist.





Sample obtained from Bolton, C. E., and assayed by Messrs. Willson & Robb, Mining Engineers, Montreal, yielded 53.3 per cent. of sesqui-oxide of chromium.

To convert the ore into chromate and bi-chromate of potassa, it undergoes the process of oxidation, and is then united with potassa—the residue, being protoxide of iron, is available for other purposes, but at present estimated with the impurities or waste.

The estimated cost of oxidizing, &c., is as follows:—

Take 14 equivalents of 150 lbs. each, of crude chromic iron, delivered say at Boston;

	\$	c.
Or say 2100 lbs. at the rate of \$20 per ton of 2000 lbs.....	21	00
Grinding	5	00
Wear and tear of Machinery	2	00
Labor 2 men at \$6 per week, 3 days.....	6	00
476 lbs. waste by washing ore. &c.	5	00
<hr/> 1624		
Steam power.....	13	00
1st process gives available material 1624 lbs., at cost of	\$52	00
30 equivalents of Nit. Pot. 102 lbs. each, 3060 at 10 cts.	306	00
Labor 2 men one week at \$6 each.....	12	00
Fuel for furnace	10	00
Wear and tear of same, say.....	4	00

Preliminary Loss:

108 Equivalents of Oxy. Gas at 8 lbs. each, 864	Deutoxide of Nitro-
30 " Nit. " " 14 " 420	gen free.
2 " Potassa " 48	96
14 " Iron " 36	504—1884 lbs. Loss.

Product:

14 Equivalents Sesquioxide Chm. 80 each, 1120	Labor.....	6	00
42 " Oxygen 8 " 336	} Chromate of		
28 " H. O. 48 " 1344			

Thus of chromate of potassa, 2800 lbs., cost..... \$390 00
 This quantity at 14 cents per lb, would be 392 00
 The lowest market value is 20 cents, which gives a profit of \$6 per 100 lbs.

For Bichromate of Potassa:

Take the whole amount of 2800 lbs. chromate, and by the aid of acid converted into bi-chromate, say:

28 Equivalents chromate of potassa each 100 lbs. (2800 lbs.) cost..	\$390	00
14 " " Nitric acid N.O. ₃ " 70 " 980 at 10 cents....	98	00
	<hr/> 488	00
Labor.....	7	00
	<hr/> \$495	00

N.B.—Nitric acid is used instead of sulphuric on account of its being available for recovering the lost potash—which may then, as nitrate of potash, be used over again in the 1st process.

Produce:

14 Equivalents Nit. Pot. each 102 lbs. 1428 lbs. at 10 cts.	\$142 80	
Bi-chromate of potash 2352 at 15 cts.	352 80	\$495 60

Thus chromate of potash is produced at the low price of 14 cts. per lb., and bi-chromate at 15 cts.

Say 2000 lbs. or 1 ton at 15 cts.	\$300 00
Market value in Boston, (May, 1863,) 25 cents	500 00

Net profit per ton.	\$200 00
--------------------------	----------

Or 67 per cent upon the outlay, a profit which may be considerably further increased by converting waste material, &c., into use.

EXTRACT

FROM SIR WILLIAM LOGAN'S REPORT.

Geological Survey of Canada.

The occurrence of the compounds of chrome, or chromium, in the rocks of Canada, is described on page 504. The chrome used in the arts is always obtained from the substance which is known as chromic ore, or sometimes incorrectly, chromate of iron. This is a black mineral, somewhat resembling magnetic iron; from which however it is distinguished by the color of its streak and powder, which are dark brown, and by the fact that it is not attracted by the magnet. This ore is composed of the oxydes of chrome and iron; which are however occasionally replaced in part by alumina and magnesia; so that its composition is variable. The analyses of different specimens of the pure ore give from forty to over sixty per cent. of the green oxyd or sesqui-oxyd of chrome; but inasmuch as the ore is often mingled with a greater or less amount of earthy matter, the proportions of oxyd of chrome in many commercial samples may fall considerably below the numbers just given.

The compound of chromium chiefly used in the arts is the combination of chromic acid with potash known as the bi-chromate of potash, from which are prepared the red and yellow chromates of lead; the latter being the pigment known as chrome yellow. The green oxyd of chromium is also prepared from this salt, and is used as an indeible green color in painting, and for the preparation of an indestructible green printing ink. Large quantities of the bi-chromate of potash are used in dyeing, and in calico printing; and according to the report above cited the quantity of this salt manufactured weekly in south Lancashire was, in 1861, fourteen tons. This salt consists of one equivalent, or forty-seven parts of potash, and two equivalents or one hundred and two parts chromic acid. Of this latter, fifty-one parts correspond to thirty-nine parts of the green or sesqui-oxyd of chrome; and although the metal exists in

this latter form in the ores, it is now usual for commercial purposes to give the percentage of chromic acid which these will yield. Thus the chromic iron from Bolton, which gives by analysis 45.9 per cent. of oxyd of chromium, would yield sixty per cent. of chromic acid. Rich ores of this kind are said to be worth in Baltimore, from whence large quantities are shipped, one dollar per ton, for each unit of chromic acid. This agrees closely with the price offered for the chromic ore from Ham, to be noticed below. Samples of two barrels from this locality, sent to Glasgow, and to London, in 1861, gave from 43.7 to 44.1 per cent. of oxyd of chrome. The mean of these, 43.9, equals 57.4 per cent. of chromic acid, and the prices offered for this ore in London, and in Glasgow, were respectively \$57, and \$60 sterling, per ton.

On the twenty-sixth lot of the sixth range of Bolton, is a bed of chrome ore from one to two feet in thickness, in serpentine. The bed dips eastward, at an angle of about 80 degrees, and the ore appears to occur in detached masses of from fifty pounds to half a ton in weight. The assay of a portion of this ore, as stated above, gave 60.0 per cent of chromic acid.

The principal supplies of this ore are now obtained from the States of Pennsylvania and Maryland, and from Norway. The annual consumption for the manufacturing establishments of South Lancashire alone, must be equal to about 1000 tons of ore, yielding 50.00 per cent. chromic acid. The process of manufacturing the bi-chromate of potash is one which might, as Mr. McFarlane has suggested, very well be carried on in this country. It consists simply in calcining the finely ground ore with crude potash, in a proper furnace, exposed to a current of air, by which the chromic oxyd is acidified, and unites with the potash. The resulting mass is lixiviated with water, and the solution, being mixed with a certain amount of sulphuric acid, furnishes by evaporation crystallized bi-chromate of potash. In the absence of sulphuric acid, a crude neutral chromate of potash might readily be prepared by simple evaporation, and shipped to England, to be there converted into bi-chromate. The cheapness and facility with which the ore, the potash, and the requisite fuel may be obtained in the Eastern Townships are such as to offer encouragement for the working of the chrome ores in this country.

BYE - LAWS.

CHROME MINING AND MANUFACTURING COMPANY.

First. Said Corporation shall be known and called by the name of "The Chrome Mining and Manufacturing Company." Its business shall be the mining of chromic ore and the manufacturing same and other metals in the township of Bolton, Canada East, and its principal office shall be in the city of Boston, in the Commonwealth of Massachusetts.

Second. The Board of Directors shall consist of not less than five members, to be chosen annually by ballot; and said Board shall choose one of their number to be President of the Corporation, whose duty it shall be to preside at all meetings of the Corporation and Directors, and in general to perform all the duties incident to such corporate office. In his absence, the Board may appoint a president *pro tempore*, with like powers.

Third. A Clerk and Treasurer, who may be one and the same person, shall be appointed and chosen by the Board of Directors, who may also appoint a superintendent or agent, and such other officers as they may deem expedient. The compensation of all officers or agents chosen or appointed by the Board of Directors shall be fixed by the Board by their votes, duly recorded, and such officers or agents shall be removable by the Board at pleasure.

Fourth. The annual meeting of the Corporation shall be held on the second Tuesday of February in each year, at such time and place as the Directors shall designate,—due notice of which shall be given by the clerk in such manner as the Directors shall prescribe, either by personal notice to each stockholder, or by publication in the newspapers, in either mode seven days at least before the day of meeting. And special meetings may be called by giving written notice to each stockholder, by order of the Board, at the request of the President, or of stockholders representing one-fifth part of the capital stock.

Fifth. A record of all the proceedings of the Corporation, of the original Articles of Agreement, of the By-Laws, and of all conveyances to and from the Corporation, shall be kept by the clerk; and the Directors shall also cause a record to be kept of their proceedings, which shall be subject to the examination of the stockholders at any meeting of the Corporation.

Sixth. The Directors shall cause a suitable seal to be prepared, which, when adopted by them, and a description thereof entered by the clerk in the records of the Corporation, shall be deemed and taken to be the "Seal of the Corporation."

Seventh. The Treasurer shall give bonds, with sureties satisfactory to the Directors, in a sum not less than *Ten Thousand Dollars*; and the Directors shall cause a monthly examination of his accounts, with the vouchers therefor, to be made by a committee of the Board, who shall sign a report thereof upon the Directors' records. At the annual meeting a similar examination shall be made by a committee of the stockholders, whose report, signed by them, shall be entered by the Committee upon the records of the Corporation: and the acceptance of the bond of the treasurer shall precede his authority to act as treasurer.

Eighth. All assessments made upon the stock of the Corporation shall be by a stock vote of the Corporation at a stockholders' meeting, and all notes, acceptances, contracts and obligations, to be binding upon the Corporation, shall have affixed to them the signatures of the President and Treasurer.

Ninth. The capital stock of the Corporation shall be the sum of *Three Hundred Thousand Dollars*, to consist of *Thirty Thousand Shares*, of the par value of *Ten Dollars Each*, certificates of which, *duly numbered*, signed by the President and Treasurer, shall be issued to the several stockholders under the seal of the Corporation, and be duly recorded by the clerk upon their first issue, and upon every subsequent transfer of the same.

Tenth. The By-Laws of the Corporation may be altered, amended or repealed at any meeting in the notice for which such alteration, amendment or repeal is proposed, by a vote of the majority of the entire capital stock of the Corporation, and not otherwise.

